

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/540,026 Confirmation No. 8866
Applicant : Bertram SUGG
Filed : January 25, 2006
TC/A.U. : 2834
Examiner : B. Gordon

Docket No. : R.304045
Customer No. : 02119

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: July 23, 2009

RESPONSE UNDER 37 C.F.R. § 1.116

Sir:

In response to the Final Office action of April 23, 2009, applicant responds as follows:

Remarks begin on page 2 of this paper.

BG
Ok to enter arguments
07/29/2009

REMARKS

Claims 9-10, 13-14 and 29-32 remain in this application.

The examiner rejected apparatus claims 9-10, 13-14 and 29-32 as anticipated by Schreiner et al.

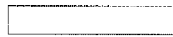
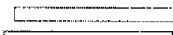

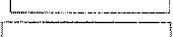

THE REJECTION WAS INCOMPLETE

AS A MINIMUM IT SHOULD BE REDONE AS A COMPLETE OFFICE ACTION

MPEP 707.07(f) states, in part, *"Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."*

For several replies now, most notably in the last response dated March 4, 2009, applicant has argued that the product-by-process claims, 29-32, recite a process for making the apparatus which will result in **structure which is different** from the structure of Schreiner et al, and that therefor it is not proper to reject these claims under 35 USC 102. But in this Final Office action, similar to what was done in prior office actions, the examiner has sloughed off these arguments saying that they are moot.

As pointed out previously, the structure of Schreiner et al does not provide an insulation layer which covers the edges of the inner electrodes, whereas the product as recited in claims 29-32 does have an insulation layer which covers the inner electrodes. As shown in the greatly enlarged sketch below, the areas adjacent the inner electrodes of Schreiner et al will not have insulation present, because only the piezoelectric layers receive a sintered skin.

| | | |
|-------------------------------|---|---------------------|
| Area with sintered insulation |  | Piezoelectric layer |
| Area with no insulation |  | Inner electrode |
| Area with sintered insulation |  | Piezoelectric layer |
| Area with no insulation |  | Inner electrode |
| Area with sintered insulation |  | Piezoelectric layer |

The situation is different with applicant's structure. Since, as recited in claims 29-32, the entire piezoelectric stack is coated with piezoelectric material and then this coating is sintered, even the areas immediately outside the inner electrodes will have an insulation layer of sintered piezoelectric material. Thus applicant's structure as claimed in claims 29-32 is different from the structure of Schreiner et al. Therefore, the rejection under 35 USC 102 is not proper, and the examiner's comment that applicant's argument is moot is inappropriate.

Accordingly, a new and complete Office action is in order, including, if the examiner still believes this to be true, an explanation of how Schreiner et al meets all the limitations of the claims, including that the entire stack, inner electrodes and all, will receive a sintered skin of piezoelectric material. In the absence of such a full and complete Office action, allowance of this application is in order.

Applicant does not agree with any of the rejections in the Office action for the following reasons:

From the Schreiner et al. reference, that a piezoelectric actuator can be provided with an insulating coating is indeed known; the insulating coating is a so-called sintered skin. This skin of Schreiner et al. is created as part of the sintering process, and it is formed from the material

of the piezoelectric layers of the stack. The reference to Schreiner et al. has no indication whatsoever that an additional insulating layer is applied to the stack while the piezoelectric stack is in its green state, before sintering, as is recited in claim 9. The disclosure of Schreiner et al. never states that such a layer is added to the stack.

In the absence of any disclosure of such a layer being added to the stack and that then the composite stack and its coating is sintered, the reference to Schreiner et al. has structure which is very similar, but is different from the structure which is recited in the claims of this application. With no disclosure in Schreiner et al. of such an insulation layer being added, the skin of Schreiner et al. will be formed from the piezoelectric layers. And with this being the case, the insulation layer which results in Schreiner et al. will have depressions where the inner electrodes are positioned, and the inner electrodes will not be insulated. Further, the insulation layer of Schreiner et al will not have the smooth surface as will be the case for the structure as recited in applicant's claims, since the insulation layer of Schreiner et al will have small depressions at the edges of the inner electrodes.

And the following additional difference exists between the structure of Schreiner et al. as compared to applicant's, in that, according to their disclosure, **there will be no insulation over the inner electrodes** of Schreiner et al. This fact is shown by Schreiner et al. in figure 3, wherein the inner electrodes are shown to not have a coating of an insulation layer. Schreiner et al. never, not anywhere in their disclosure, include mention of insulation which will cover the inner electrodes.

As opposed to this, claim 9 recites that an insulation layer is **added** before sintering.

While this is a limitation which is couched in terms of a process, it nevertheless is a limitation of the claim. And this limitation, even though couched in the form of a process step, results in structure which is not in any way disclosed by Schreiner et al. This process step of coating the stack with material which is recited to be comprised of the same material as the piezoelectric layers, and doing so before sintering, leads to an insulation layer, after sintering, which coats the entire outside of the stack except for where the outer electrodes are to be placed. And this includes that the insulation layer is present over the edges of the inner electrodes. **Schreiner et al. has no electrical insulation over the edges of their inner electrodes.**

If the examiner can show the product which will result from the recited process is taught by one or more of the references, he may have a valid rejection. However, in the present instance, that is not the situation. Certainly not with regard to the presently cited prior art.

None of the cited prior art, not even Schreiner et al., teaches an apparatus which has a piezoelectric stack, which also has a coating which consists of the **same material** as the piezoelectric layers themselves, with this structure being created prior to sintering the stack as recited in claim 29. Schreiner et al. may well sinter their stack and thus obtain a sintered skin on the outside of their piezoelectric layers, see for example Schreiner et al. at the last two lines of paragraph 21. **But this leaves the problem that the electrodes 11 of Schreiner et al. will never be covered, and never have an insulation layer at their edges.** Schreiner et al. never recites adding any coating to the stack, they only recite that the stack is sintered. This results in structure which is different from applicant's in that applicant's structure has a layer of sintered piezoelectric material covering the outer edges of the inner electrodes, whereas the structure of

Schreiner et al does not have this covering of the outer edges of the inner electrodes.

The structure of Schreiner et al. is not the same as will result from the process recited in claims 29-32. The product which will result from the process of these claims will have a layer of sintered piezoelectric material covering the edges of the inner electrodes. **Schreiner et al. does not have this structure,** and so the rejection under 35 USC 102 is not appropriate.

Claim 30 goes on from claim 29 to recite that the structure is sintered after a layer of the piezoelectric material is used as the coating. Again, the cited prior art, and especially the reference to Schreiner et al., does not teach this structure. While Schreiner et al. do indicate a sinter skin 17, this sinter skin does not cover the inner electrodes. Furthermore, if, as has been assumed by the examiner, the sinter skin is the same material as the piezoelectric layers themselves, then the sinter skin will not be smooth as recited in claim 30, since it will have small indentations where it does not cover and insulate the edges of the inner electrodes. Schreiner et al. will have rough edges in their sinter skin at the internal electrodes since there will be small indentations at these inner electrodes. The coating of Schreiner et al will not be smooth as recited in claim 30, and these inner electrodes will not be insulated as will be the structure which results from applicant's claims 29-32.

Claim 31 goes on to add that after the coating is sintered, portions of the sintered coating are removed. Again, it is clear that the reference to Schreiner et al. does not teach this structure, since there is no teaching in Schreiner et al. of coating the piezoelectric stack with material which is the same as the material of the piezoelectric layers. And further, in the last 4 lines of paragraph

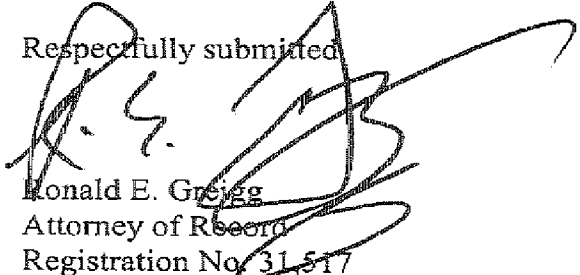
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6, Schreiner et al. disclose that any removal of the skin is done before sintering so as to make removal easier. Clearly, Schreiner et al. do not teach the structure which is recited in claim 31.

Claim 32 goes on to add that after portions of the coating have been removed, outer electrodes are added. Here again it cannot properly be said that the structure taught by Schreiner et al. is the same as recited in applicant's claims.

For all of the above reasons, whether taken singly or in combination with each other, entry of this amendment and allowance of the claims are courteously solicited.

Respectfully submitted



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